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(71)Applicant : MITSUBISHI CHEM CORP

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(72)Inventor : KAMINAMI YASUO

(54) HIGH-RIDGE FRUIT PLANT CULTIVATION METHOD

(57)Abstract:

PURPOSE: To efficiently perform the cultivation of a high-ridge fruit plant and obtain a fruit having low citric acid content and improved polarization by covering the ridge surface around the root of a fruit plant with an air-impermeable synthetic resin film, etc., and covering the valley part of the ridge with an air-permeable porous synthetic resin film, etc.

CONSTITUTION: A high-ridge fruit plant such as orange, apple, grape and watermelon is cultured by covering the ridge surface around the root part of the fruit plant with an air-impermeable synthetic resin film or sheet and covering the valley part between the ridges with an air-permeable porous synthetic resin film or sheet having an air-permeability of 200-5,000sec/100mL, a water-resistance pressure of $\geq 500\text{mmH}_2\text{O}$ and a moisture permeability of 1,000-10,000gH₂O/m².24 hr and laminated on at least one surface with a nylon, polyester or PE nonwoven fabric having an areal density of 15-30g/m² at a contact area ratio of 10-50%.

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(21) 出願番号	特願平6-20424	(71) 出願人	000005968 三菱化学株式会社 東京都千代田区丸の内二丁目5番2号
(22) 出願日	平成6年(1994)2月17日	(72) 発明者	神波 康夫 東京都千代田区丸の内二丁目5番2号 三 菱化成株式会社内
		(74) 代理人	弁理士 長谷川 曉司

(54) 【発明の名称】 高畝式果実植物栽培方法

(57) 【要約】 (修正有)

【目的】 ミカン、リンゴ、ブドウ、スイカ等の木本性又は草本性の果実植物を高畝式で栽培するにあたり、糖度等の品質の向上した果実類を得る方法を提供する。

【構成】 非通気性のフィルム又はシートで果実植物の根本周辺の畝面を覆い、多孔フィルム又はシートで果実植物の根本から離れた谷部分を覆う。

【特許請求の範囲】

【請求項1】 地面に培土により畝を形成し、該畝に果実植物を栽培する高畝式果実植物栽培方法において、果実植物の根本周辺の畝面を非通気性の合成樹脂フィルム又はシートで被覆し、畝同士の間の谷部分に通気性を有する合成樹脂製多孔フィルム又はシートで被覆することを特徴とする高畝式果実植物栽培方法。

【請求項2】 合成樹脂製多孔フィルム又はシートが、透気度が $200 \sim 5000$ 秒/ 100 m l 、耐水圧が $500\text{ mm H}_2\text{ O}$ 以上、透湿度が $1000 \sim 10,000\text{ g H}_2\text{ O/m}^2 \cdot 24\text{ h r.}$ とされた合成樹脂製多孔性フィルム又はシートであることを特徴とする請求項1に記載の方法。

【請求項3】 合成樹脂製多孔性フィルム又はシートは、少なくとも片面に、目付けが $15 \sim 30\text{ g/m}^2$ のナイロン系、ポリエステル系又はポリエチレン系の不織布が接着面積を $10 \sim 50\%$ として貼り合わされてなるものであることを特徴とする請求項1又は2記載の方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、地面に畝を設け、この畝に果実植物を植えて栽培する高畝式果実植物栽培方法の改良に関する。

【0002】

【従来の技術】ミカン、リンゴ、ブドウ、スイカ等の木本性又は草本性の果実植物の栽培方法として高畝式の栽培方法がある。この高畝式の栽培方法とは、地面に培土により畝を設け、この畝に植物を植え、栽培するもので、畝に肥料や水を施すことにより集中管理が可能となり、果実等の密生栽培に用いられている。

【0003】一方、青果物は、収穫の3～4カ月前から収穫時にかけて、降雨等により根から水が供給されると、果実内の水分増加と呼吸量増加を招き、糖度や酸度が減少し品質が低下することが知られている。この為、品質向上を目的に、一般には収穫前に畝部分やその間の谷間部分を敷わらで覆い、土壌への水分の遮断を行うことが考えられる。しかし敷わらは防水性が低い為大きな効果は得られない。

【0004】また、畝等の地表面を非通気性のビニールシート等で被覆する方法も考えられるが、非通気、非透湿性のシートで被覆したままおくと、通気性が悪い為、呼吸により発生する炭酸ガスが地下部に充満し、根が窒息状態となり逆効果を招く恐れがある、従って、晴天の時はシートを除いて裸地化し、雨天の時のみシートで地表面を被覆する作業が必要であるが、これは作業が煩雑である。

【0005】

【発明が解決しようとする課題】本発明は高畝式栽培において、品質の向上した青果物を得ることのできる方法

を提供することを目的とするものである。

【0006】

【課題を解決するための手段】本発明の要旨は、地面に培土により畝を形成し、該畝に果実植物を栽培する高畝式果実植物栽培方法において、果実植物の根本周辺の畝面を非通気性の合成樹脂フィルム又はシートで被覆し、畝同士の間の谷部分に通気性を有する合成樹脂製多孔フィルム又はシートで被覆することを特徴とする高畝式果実植物栽培方法に存する。

【0007】本発明で用いられる非通気性の合成樹脂フィルム又はシートとは、ポリエチレン、ポリプロピレン、ポリ塩化ビニル等の通常一般に農業等に用いられている熱可塑性合成樹脂の単層、多層、着色、無着色のフィルムが用いられる。このような非通気性の合成樹脂フィルムで畝面を被覆することにより果実植物の収穫前数ヶ月間の水の供給を少なくし、糖度を向上させる役をなす。

【0008】一方、非通気性の合成樹脂フィルムで畝面や畝同士の間の谷部分まで被覆すると前述したような根の窒息を招く。このため、畝同士の間の谷部分は通気性を有する合成樹脂製多孔フィルム又はシートで被覆することにより地中の蒸気を放出し、根の呼吸を助けるようにする。

【0009】本発明で用いられる通気性フィルム（合成樹脂製多孔フィルム又はシート）とは空気、水蒸気等の気体に対して透過性を有し、且つ水滴（液体）に対し非透過性を有するフィルムで、上記性能を有するものであれば広い範囲から選ばれるが、透気度 $200 \sim 5000$ 秒/ 100 m l または耐水圧 $500\text{ mm H}_2\text{ O}$ 以上の性能のフィルムが良い。

【0010】ここで、透気度はJIS-P-8117に規定する方法、透湿度はJIS-Z-0208に規定する方法、また、耐水圧はJIS-L-1092A法により測定される値である。透気度が小さすぎるとガス透過性が悪くガス傷害を引きおこし根を傷める原因となる。また耐水圧が小さいと、水滴が浸みこみ土が適度の乾燥状態に保てず品質向上効果が不明確となると同時に防水性を増す為にフィルムを厚くする事が必要となり、フィルムが重く、厚くなるため取扱い性が悪くなり不適となる。フィルム厚に関しては特に制限はないが、実用上 $15\text{ }\mu\text{ m} \sim 50\text{ }\mu\text{ m}$ が好ましい。フィルム材質についても特に規定されるものではないが、通常、ポリエチレン、ポリプロピレン等のポリオレフィン系樹脂製フィルムが好適に使用される。

【0011】かかるフィルムは次記の方法で製造することができる。ポリオレフィン樹脂（A）はエチレンもしくはプロピレンのホモポリマー又はエチレンもしくはプロピレンと他のコモノマー（炭素数4以上の二重結合を分子内に1個以上有する化合物）とのコポリマーからなる密度（ ρ ） 0.930 g/cm^3 以下、メルトインデ

ックス (MI) 2 g/10 分以下のポリオレフィン系熱可塑性樹脂、たとえば低密度ポリエチレン、線状低密度ポリエチレン、エチレン-酢酸ビニル共重合体、密度 0.910 以下の超低密度ポリエチレン、ポリプロピレン、エチレン-プロピレン共重合体、エチレン-プロピレン-ジエン共重合体、エチレン-メタアクリル酸エステルもしくはこれらの混合物等いずれでも良いが、好ましくは密度 0.91-0.95 g/cm³ の線状低密度ポリエチレン 50-100 重量部と密度 0.91 g/cm³ 未満のエチレン- α -オレフィン共重合体 50-0 重量部とからなる ρ が 0.930 g/cm³ 以下、MI が 2 g/10 分以下のポリオレフィン系熱可塑性樹脂である。

【0012】線状低密度ポリエチレンは、エチレンと他の α -オレフィンとの共重合体であり、例えばエチレンと、その 4~17 重量%程度、好ましくは 5~15 重量%程度の 1-ブテン、1-ヘキセン、1-オクテン、1-デセン、4-メチル-1-ペンテン等の他の α -オレフィンとを、中低圧法高密度ポリエチレン製造に用いられるチーグラ型触媒又はフィリップス型触媒を用いて共重合することにより製造される。

【0013】上記エチレン- α -オレフィン共重合体としては、通常、エチレンと炭素数 3 以上の α -オレフィンとの共重合体であって、その密度が 0.91 g/cm³ 未満のものが好ましく、より好ましくは 0.85~0.90 g/cm³ のものである。エチレンと共重合させる炭素数 3 以上の α -オレフィンとしてはプロピレン、1-ブテン、1-ペンテン、1-ヘキセン、4-メチル-1-ペンテン等が挙げられ、これらと共に 1, 4-ヘキサジエン、ジシクロペンタジエン、エチリデンノルボルネン等の非共役ジエンを使用することもできる。

【0014】上記エチレン- α -オレフィン共重合体は、チーグラ型触媒、中でもオキシ三塩化バナジウム、四塩化バナジウム等のバナジウム化合物と有機アルミニウム化合物とからなる触媒を用いて、エチレンと α -オレフィンとを共重合させることにより製造することができ、共重合体中のエチレン含有量が 40~90 モル%の範囲であり、 α -オレフィンの含有量が 10~60 モル%の範囲であるのが望ましい。上記エチレン- α -オレフィン共重合体の市販品としては例えば、CdF Chimie E. P. 社の NORFLEX (FW1600, FW1900, MW1920, SMW2440, LW2220, LW2500, LW2550) ; 日本ユニカー社のフレックスレジン (DFDA1137, DFDA1138, DEFD1210, DEFD9042) ; 三井石油化学社のタフマー (A4085, A4090, P0180, P0480) 、日本合成ゴム社の JSR-EP (EP02P, EP07P, EP57P) など が挙げられる。

【0015】単独もしくは混合物であるポリオレフィン

樹脂 (A) の密度 (ρ) は 0.930 g/cm³ より大きいと、可塑剤とラジカル発生剤の相乗効果が小さく引裂強度が向上しない。また MI は 2 g/10 分より大きいと、フィルムの引裂強度が低下し、また成形安定性が低下する。

【0016】本発明方法においてメルトインデックス (MI) とは JIS-K-6760 の引用規格である JIS-K-7210 の表 1 の条件 4 に準拠して測定した値である。なお、ポリオレフィン樹脂には、常法に従い、熱安定剤、紫外線安定剤、顔料、帯電防止剤、蛍光剤等を添加しても差支えない。

【0017】次に成分 (B) の充填剤としては、無機及び有機の充填剤が用いられる。無機充填剤としては、炭酸カルシウム、タルク、クレー、カオリン、シリカ、珪藻土、炭酸マグネシウム、炭酸バリウム、硫酸マグネシウム、硫酸バリウム、硫酸カルシウム、水酸化アルミニウム、酸化亜鉛、水酸化マグネシウム、酸化カルシウム、酸化マグネシウム、酸化チタン、アルミナ、マイカ、アスベスト粉、ガラス粉、シラスパルレーン、ゼオライト、珪酸白土等が使用され、特に炭酸カルシウム、タルク、クレー、シリカ、珪藻土、硫酸バリウム等が好適である。

【0018】有機充填剤としては、木粉、パルプ粉等のセルロース系粉末等が使用される。これらは単独で又は混合して用いられる。充填剤の平均粒径としては、30 μ m 以下のものが好ましく、10 μ m 以下のものが更に好ましく、0.8~5 μ m のものが最も好ましい。粒径が大きすぎると延伸物の気孔の緻密性が悪くなり、又粒径が小さすぎると、樹脂への分散性が悪く、成形性も劣る。

【0019】充填剤の表面処理は、樹脂への分散性、更には延伸性の点で、実施されている事が好ましく、脂肪酸又はその金属塩での処理が好ましい結果を与える。成分 (C) の可塑剤は分子内にエステル結合もしくはアミド結合を有する分子量 100 以上、かつ常圧での沸点が 200℃以上かつ融点が 100℃以下の化合物である。例えば、オレイン酸アミド、ステアリン酸アミド、ジオクチルフタレート、トリオクチルトリメリテート等が挙げられる。

【0020】好ましくは、分子量 350 以上、かつ常圧での沸点が 250℃以上、融点が 50℃以下で炭素数 6 以上のカルボン酸と炭素数 5 以上のアルコールとからなるエステル化合物、更に好ましくは、分子量 350 以上、かつ常圧での沸点が 250℃以上、融点が 30℃以下で、芳香族カルボン酸と炭素数 6 以上のアルコールとからなるエステル化合物、例えば、DOP、トリオクチルトリメリテート、DIDP 等である。

【0021】融点は 100℃より高いとラジカル発生剤での変性による引裂強度向上の効果が少なく、また沸点が 200℃未満では、成形加工時の発煙、発泡により成

形・延伸性が低下する。また分子量が小さいと、フィルムから可塑剤のブリーディングが早く好ましくない。

【0022】次に、本発明に使用される成分(D)のラジカル発生剤としては、半減期1分となる分解温度が130~300℃の範囲のものが好ましく、例えばジクミルペルオキシド、2,5-ジメチル-2,5-ジ(t-ブチルペルオキシ)ヘキサン、2,5-ジメチル-2,5-ビス(t-ブチルペルオキシ)-3-ヘキシシ、 α , α' -ビス(t-ブチルペルオキシイソプロピル)ベンゼン、ジベンゾイルペルオキシド、ジ-t-ブチルペルオキシド等の過酸化物が挙げられる。

【0023】本発明においては、ポリオレフィン樹脂(A)100重量部に対して充填剤(B)100~400重量部、可塑剤(C)1~100重量部、及びラジカル発生剤(D)0.0001~0.1重量部の範囲で用いるのが好ましい。充填剤(B)の割合が100重量部に満たないと、延伸したフィルムに気孔が充分形成されず、多孔化度合が低くなる。また、充填剤の割合が400重量部を超えると混練性、分散性、フィルム又はシート成形性が劣り、更に延伸物の表面強度が低下する。

【0024】本発明において、特に好ましい配合割合は、ポリオレフィン樹脂(A)100重量部に対して充填剤(B)120~300重量部である。可塑剤(C)は1重量部よりも少ないと、引裂強度向上の効果が無く、100重量部よりも多いと、混練性、分散性が悪化し、フィルム成形性の低下、延伸性を確保できない。好ましくは5重量部以上50重量部以下である。

【0025】ラジカル発生剤(D)は0.0001~0.1重量部の範囲から選ばれ、この範囲よりも少ない場合は可塑剤との相乗効果による引裂強度の向上は得られず、またこの範囲よりも多い場合はメルトインデックスが低くなり過ぎて、フィルム成形時に膜切れが起りやすく、かつフィルム表面に肌荒れが生起するので好ましくない。

【0026】本発明においては、ポリオレフィン樹脂(A)、充填剤(B)、可塑剤(C)、及びラジカル発生剤(D)を、通常は、例えば次のI又はIIの方法により前記の量比で混合し、次いで混練してペレット化した後、インフレーション成形して未延伸フィルムとする。方法I:ポリオレフィン樹脂、充填剤、可塑剤及び、ラジカル発生剤を混合し、押出機、バンパリーミキサー等の混練機を用いて混練した後、ペレット化し、このペレットを用いてインフレーション成形する。

方法II:ポリオレフィン樹脂に、多量のラジカル発生剤0.5~1%(5000~10000ppm程度)を配合し、ラジカル発生剤がポリオレフィンと殆ど反応しない温度で、しかもポリオレフィンの融点以上の温度において熔融混練してペレット状としたマスターバッチを予め調製し、このマスターバッチを、ポリオレフィン樹脂、充填剤及び可塑剤と混合し、混練した後ペレット化

し、このペレットを用いてインフレーション成形する。

【0027】上記I又はIIに示す方法に従って、ポリオレフィン樹脂をラジカル発生剤と共に加熱下(好ましくはラジカル発生剤の半減期が10分となる温度以上の温度で)混練処理すると、ラジカル発生剤による架橋反応が生じポリオレフィンが分子間カップリングして高分子量成分が増加し、かつメルトインデックスの低下した変性ポリマーが得られる。この変性ポリマーは、変性前のポリマーに比べてインフレーション成形時に横方向の配向がかかり易く、このようにして得られたフィルムは、これを延伸処理した場合に、引張り強度及び衝突強度が著しく向上する。

【0028】ポリオレフィン樹脂、可塑剤、ラジカル発生剤及び充填剤を混合するには、ドラム、タンブラー型混合機、リボンブレンダー、ヘンシェルミキサー、スーパーミキサー等が使用されるが、ヘンシェルミキサーのような高速攪拌型の混合機が望ましく、ポリエチレンは通常10~150メッシュ、特に20~60メッシュのパウダーの形態で供給するのが好ましい。得られた混合物の混練は、例えばスクリュウ押出機、二軸スクリュウ押出機、ミキシングロール、バンパリーミキサー、二軸型混練機等の周知の混練装置を用いて実施される。

【0029】本発明においては、上記で得た配合物からインフレーション法により未延伸フィルムを成形し、次いでこの未延伸フィルムを延伸処理する。インフレーション成形は、ブローアップ比(BUR)を2~8で成形する。好ましくは、ブローアップ比3~6、フロストラインの高さをダイの環状スリットの直径の2~50倍にする。さらに好ましくはフロストラインの高さをダイの環状スリットの直径の5~20倍の範囲の条件下で行なわれる。ブローアップ比が上記範囲よりも低いとフィルムの引張り強度及び衝撃強度が低下し、上記範囲よりも高いとバブルの成形安定性が低下するので好ましくない。また、フロストラインの高さが上記範囲よりも低いとフィルムの引張り強度が低下し、上記範囲よりも高いとバブルの成形安定性が低下するので好ましくない。

【0030】インフレーション法により成形された未延伸フィルムは、次いで縦方向(フィルムの引き取り方向)に一軸延伸される。一軸延伸には通常ロール延伸法が採用されるが、チューブラー延伸法で一軸方向(引き取り方向)を強調させた形であってもよい。また、延伸処理は一段でも二段以上の多段でも差支えない。延伸処理は樹脂組成物の融点より100℃低い温度から融点より20℃低い温度の範囲、特に樹脂組成物の融点より90℃低い温度から融点より50℃低い温度の範囲で実施するのが好ましく、この範囲より低い温度ではフィルムに延伸斑が発生し、またこの範囲より高い温度ではフィルムの多孔性が低下する傾向がある。

【0031】延伸倍率は1.2~8倍であることが必要であり、この範囲未満では延伸フィルムの多孔化及び引

張り強度が不十分である。また延伸倍率が8倍を超えると、フィルムは縦方向への過度の分子配向を有するものとなり、フィルムの面強度が低下して好ましくない。なお、一軸延伸後に熱処理すればフィルムの寸法精度を安定化することができ、また公知のコロナ処理、フレイム処理等の表面処理を施すこともできる。

【0032】このようにして得た、微細孔が形成されることにより透気度が200～5000秒/100ml、耐水圧が500mmH₂O以上、透湿度が1000～10,000gH₂O/m²・24hr.とされた合成樹脂製多孔性フィルム又はシートは、非通気性の合成樹脂製フィルム又はシートと長手方向に併設した状態で結合しても良い。

【0033】非通気性の合成樹脂製フィルム又はシートと合成樹脂製多孔性フィルム又はシートとは熱溶着、超音波溶着、縫製、接着等の手段で結合しても良い。このような果実植物栽培用フィルム又はシートは収穫の3～4カ月前から収穫時にかけて、木本性又は草本性の果実植物の根本周辺の畝面及び谷部分を被覆して用いられる。多孔性フィルム又はシートで畝同士の谷部分を覆い、非通気性フィルム又はシートで果実植物の根本の畝部分を覆うように用いられる。このようにして、水分と呼吸量の調整を行い、糖度や酸度の高い果実を得る。

【0034】多孔質フィルムに不織布を貼り合せてもよい。不織布はナイロン（例えばナイロン6、ナイロン66、ナイロン12等）又はポリエステル（例えばポリエチレンテレフタレート、ポリブチレンテレフタレート等）又はポリエチレンからなり、目付が15～30g/m²のものが使用される。又、不織布の繊維間固定のエンボス点密度は60ヶ/cm²～150ヶ/cm²、好ましくは80ヶ/cm²～120ヶ/cm²程度のものが良い。不織布にアルミニウム等を蒸着し、光反射能を持たせた不織布を用いることも可能である。

【0035】ポリエチレン系不織布としては芯材としてポリエステル樹脂を用いポリエチレンで被覆した構造の繊維を用いたものが良い。又、ポリエチレン系の割繊維等を用いた割布を熱融着法で貼合せても良い、割布としては目付10～80g/cm²、繊維太さは10～2000デニール、好ましくは70～700デニールのものが良い。

【0036】このような多孔性フィルムと不織布や割布とは以下のような接着構造で貼り合される。すなわち、例えば、ウレタン系2液タイプの接着剤を塗布面積（接着面積）10%～30%で点状に塗布して接着する方法が挙げられる。接着剤の点部分は318万個/m²～1000万個/m²程度で、その点の径は0.1～0.5mm程度とするのが良い。このような接着剤の点状塗布は例えばグラビアロールを用いた転写法等で行えば良い。

【0037】ポリエチレン系不織布や、割布の場合、多

孔質フィルムと熱接着するのが良い。接着面積は上記と同程度とするのが良い、空隙の多い不織布を用い不織布の全面で溶着しても、多孔質フィルムの接着部分の割合が上記範囲にあれば良い。熱接着面積が広すぎると多孔質フィルムの開孔が潰れてしまうので注意を要する。多孔質フィルム、割布、ポリエチレン系不織布の3層積層品でも良い。

【0038】上述した構成の積層体によると、多孔質フィルムと不織布とを貼り合せている接着部が極めて微細であることや、また多孔質フィルムの厚さなどを要因として多孔質フィルムの表面が非常に平滑となり、その結果当該表面への印刷も極めて鮮明にでき、しかも全体として風合は著しく向上し且つ通気性を損うことはない。

【0039】上述した積層体の不織布はスパンボンド不織布やニードルパンチ不織布等、種々の製法による不織布で良い。また、両者の接着について、接着剤の塗布法としてグラビアロールによる転写法を例示したが、噴霧法なども用いることができる。但し、この場合用いられる接着剤は例えばEVA系接着剤、ゴム系接着剤又はアクリル系接着剤などを用いることが好ましい。

【0040】このような果実植物栽培用フィルム又はシートを収穫前1～2カ月から収穫にかけて果実植物の根本周辺の畝部分及び谷部分に被覆することで本発明の目的である青果物の品質向上が達せられる。品質向上効果は青果物の種類によっても異なるが具体的には糖度上昇、裂果防止、色つや向上等である。被覆する方法は、非通気性のフィルム又はシートで果実植物の根本周辺の畝面を覆い、多孔性フィルム又はシートが果実植物の根本から離れた谷部分を覆うように用いられる。本発明の果実植物栽培用フィルム又はシートが適用される青果物の種類は特に制限はないが、例えばミカン、ハッサク等のカンキツ類、リンゴ、ナシ、モモ、ブドウ、メロン、スイカ等が挙げられる。

【0041】

【実施例】以下、実施例により本発明を具体的に説明するが、本発明はその要旨を超えない限り、以下の実施例に制約されるものではない。

実施例1

線状低密度ポリエチレン {メルトインデックス (MI) : 1.0g/10分、流動比 : 19、密度 : 0.921g/cm³、共重成分 : 1-ブテン、共重合量 : 10重量%、融点 : 120℃} を40メッシュのパウダーに粉碎したものを80重量部とエチレン-プロピレン共重合体 (EPR、日本合成ゴム社製EP07P) を同じく40メッシュのパウダーに粉碎したものを20重量部とをヘンシェルミキサー中で攪拌混合し、次いでこれに可塑剤としてジオクチルフタレート4重量部とラジカル発生剤2, 5-ジメチル-2, 5-ビス (t-ブチルペルオキシ) -3-ヘキシンを0.03重量部攪拌しながら添加混合する。

【0042】更に炭酸カルシウム（平均粒径 $1.2\mu\text{m}$ 、脂肪酸処理）を200重量部添加し、攪拌混合した。かくして得られた混合物を、二軸混練機DSM-65（Double Screw Mixer、日本製鋼所（株）製）を用いて混練し、造粒した。これを $40\text{mm}\phi$ 押出機によりインフレーション成形し、厚さ $70\mu\text{m}$ のフィルムに製膜した。押出条件は下記のとおり。

【0043】

【表1】

シリンダー温度	: 170-190-210-230℃
ヘッド、ダイス温度	: 200℃
ダイス直径	: 100mm
引取速度	: 8m/min
ブローアップ比	: 3
フロストライン高さ	: 700mm
折り径	: 471mm

【0044】かくして得られたフィルムを引取方向にスリットしたものをロール延伸機により一軸延伸を行った。延伸条件は下記のとおりとした。

【0045】

【表2】

延伸温度	: 60℃
延伸速度	: 11.0m/min
延伸後のフィルム厚み	: $30\mu\text{m}$
得られた多孔フィルムの物性評価は下記のとおり。	

【0046】

【表3】

透気度	1800秒/100ml
透湿度	$3800\text{g}/\text{m}^2/24\text{Hr}$
耐水圧	$>2000\text{mm H}_2\text{O}$
引裂強度	60g/1枚
成形性	◎
柔軟性	◎
延伸性	◎

【0047】物性評価は下記によって行なった。

- 1) 透湿度 : ASTM E26-66 (E) に準ずる。
- 2) 引裂強度 : JIS-P-8116 に準じ、フィルムの引取方向を測定し、1枚当りの強度をgで求める。
- 3) 成形性 : 目視により次の基準により判定した。
◎ : バブル安定、ダイライン無し
○ : " ダイライン有り
△ : フィルム幅変動
× : 成形不可

【0048】4) 柔軟性 : 手の感触で、次の基準により判定した。

- ◎ : 極めて柔らかい
○ : 柔らかい

△ : 少し硬い

× : 硬い

5) 延伸性

◎ : 切断なし、均一延伸、延伸ムラなし

○ : 切断なし、延伸ムラ、殆どなし

△ : 切断なし、延伸ムラ、ややあり

× : 切断又は延伸ムラ大

【0049】一方、線状低密度ポリエチレン（グレード名 三菱ポリエチLL, UA420）MI:0.8g/l、密度 $0.925\text{g}/\text{cm}^3$ を用い、成型機はプラコー（株）製空冷インフレーション成形機（押出機スリユー径 $50\text{mm}\phi$ 、スクリュウ $L/D=28$ 、ダイ径 $350\text{mm}\phi$ （ダイスリットギャップ 2.2mm ））を用い、成形条件として樹脂温度 200°C 、押出量 $130\text{kg}/\text{hr}$ 、引取速度 $35.5\text{m}/\text{min}$ 、ブロー比3.0で成形し 20μ 厚 1650mm 巾の非通気性のフィルムを作成した。

【0050】高畝式とされた温州ミカンの畑に上記で得た多孔性フィルムと非通気性フィルムを施工した。畑の畝の高さは約 50cm 、ピッチ約 100cm で、畝のほぼ中央に長手方向に約 100cm ごとに温州ミカンが植えられている。畝の部分には上記の非通気性フィルムを、ミカンの木に当たる部分に開孔を形成するとともに、フィルムの側部からこの開孔に達するスリットを形成して施工した。

【0051】また、畝と畝の間の谷部分には上述の多孔フィルムを幅 150cm で施工した。施工は温州ミカン（青島温州）の収穫3ヶ月前（8月15日）に行なった。3ヶ月後（11月15日）、果実を収穫し、品質を調査した。糖度をBrix糖度計で、また、水分を重量減少率で測定した結果、糖度13度、クエン酸度0.7であった。又、果実は結実している場所によらず着色性は均一であった。

【0052】比較例1

実施例1で用いた非多孔性フィルムを果実植物栽培用フィルムとして畝面及び谷部分の全てに敷設した。温州ミカン（青島温州）の収穫3ヶ月前（8月15日）に敷設し、3ヶ月後（11月15日）、果実を収穫し、品質を調査した。糖度をBrix糖度計で、また、水分を重量減少率で測定した結果、糖度11度、クエン酸度1.2であった。又、果実の着色性は果実の結実場所により異なり、陽の当たる場所の果実の着色は良かったが葉陰や樹内に結実したものは着色性が悪かった。

【0053】

【発明の効果】本発明の方法により雨水を調節し、一方土中のガスや水蒸気は谷部分に敷設された多孔フィルム面を通し抜けさせる。こうして糖度が高く、クエン酸度が低い、品質の良好な青果物が反当りの収量も高く得られる。

CLAIMS

[Claim(s)]

[Claim 1] a ground surface -- hilling -- a ridge -- forming -- this -- fruits vegetation is grown to a ridge -- high -- a ridge -- the type fruits vegetable vegetation approach -- setting -- the ridges face of the fundamental circumference of fruits vegetation -- the synthetic-resin film or sheet of non-permeability -- covering -- a ridge -- it is characterized by covering with the porosity film made of synthetic resin or sheet which has permeability in a part for the trough between comrades -- high -- a ridge -- the type fruits vegetable vegetation approach.

[Claim 2] The approach according to claim 1 the porosity film made of synthetic resin or a sheet is characterized [200 - 5000 seconds / 100ml, and water pressure-proof / moisture vapor transmission] by being the porosity film made of synthetic resin or sheet made into 1000 - 10,000gH₂O/m² and 24hr. by air permeability more than 500mmH(s)²O.

[Claim 3] For the porosity film made of synthetic resin, or a sheet, a superintendent officer is 15-30g/m² at least to one side. Approach according to claim 1 or 2 characterized by being the thing with which the nonwoven fabric of a nylon system, a polyester system, or a polyethylene system sticks adhesion area as 10 - 50%, and it comes to unite it.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention establishes a ridge in a ground surface, and plants and grows fruits vegetation to this ridge -- high -- a ridge -- it is related with amelioration of the type fruits vegetable vegetation approach.

[0002]

[Description of the Prior Art] as the vegetation approach of arbor nature, such as a mandarin orange, an apple, a grape, and a watermelon, or herbaceous fruits vegetation -- high -- a ridge -- there is the vegetation approach of a type. this -- high -- a ridge -- the vegetation approach of a type establishes a ridge in a ground surface by hilling, plants and grows vegetation to this ridge, and by giving fertilizer and water to a ridge, the centralized control of it becomes possible and it is used for caespitose vegetation of fruits etc.

[0003] On the other hand, if garden stuff is applied from three - four months before harvest at the time of harvest and water is originally supplied by the rainfall etc., it is known that will cause the increment in moisture and the increment in respiration rate in fruits, a sugar content and acidity will decrease, and quality will deteriorate. For this reason, it is possible to intercept the moisture to a bonnet and soil for a part for a part for a ridge, or trough Mabe in the meantime by litter before harvest generally for the purpose of upgrading. However, since waterproofness of litter is low, big effectiveness is not acquired.

[0004] Moreover, it is although how to cover earth surface, such as a ridge, with the plastic sheeting of non-permeability etc. is also considered, Although the activity by which it denudes except for a sheet and earth surface is covered with a sheet only in case of rainy weather is required at the time of fine weather therefore the root is filled with the carbon dioxide gas which

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occurs by breathing, a root will be in an asphyxiation condition and there is **** which causes the opposite effect since permeability is bad if it sets covered with the sheet of non-aeration and non-moisture permeability, this has a complicated activity.

[0005]

[Problem(s) to be Solved by the Invention] this invention -- high -- a ridge -- it aims at offering the approach that the garden stuff whose quality improved can be obtained in type vegetation.

[0006]

[Means for Solving the Problem] the summary of this invention -- a ground surface -- hilling -- a ridge -- forming -- this -- fruits vegetation is grown to a ridge -- high -- a ridge -- the type fruits vegetable vegetation approach -- setting -- the ridges face of the fundamental circumference of fruits vegetation -- the synthetic-resin film or sheet of non-permeability -- covering -- a ridge -- it is characterized by covering a part for the trough between comrades with the porosity film made of synthetic resin or sheet which has permeability -- high -- a ridge -- it consists in the type fruits vegetable vegetation approach.

[0007] With the synthetic-resin film of non-permeability or sheet used by this invention, the film which is not colored [the monolayer of the thermoplastic synthetic resin usually used for agriculture etc. generally, such as polyethylene, polypropylene, and a polyvinyl chloride, a multilayer, coloring, and] is used. By covering a ridges face with the synthetic-resin film of such non-permeability, supply of the water for [before harvest] several months of fruits vegetation is lessened, and the role which raises a sugar content is made.

[0008] on the other hand -- the synthetic-resin film of non-permeability -- a ridges face and a ridge -- if it covers to a part for the trough between comrades, asphyxiation of a root which was mentioned above will be caused. for this reason, a ridge -- by covering with the porosity film made of synthetic resin or sheet which has permeability, the amount of [between comrades] trough emits a subterranean steam, and it helps breathing of a root.

[0009] Although the breathable film (the porosity film made of synthetic resin or sheet) used by this invention is a film which has permeability to gases, such as air and a steam, and has nontransparent nature to waterdrop (liquid), and it will be chosen out of the large range if it has the above-mentioned engine performance, the film of the engine performance more than air permeability 200 - 5000 seconds /, 100ml, or water pressure-proof 500mmH₂O is good.

[0010] Here, the approach of specifying air permeability to JIS-P -8117, the method of specifying moisture vapor transmission to JIS-Z-0208, and water pressure-proof are values measured by JIS-L-1092A law. If air permeability is too small, gas permeability will become the cause which causes gas injury bad and hurts its root. Moreover, since it rises while soil cannot maintain at moderate dryness by permeating and crowding waterdrop if water pressure-proof is small but the upgrading effectiveness becomes indefinite, it is necessary to thicken a film, and a film is heavy, and since it becomes thick, handling nature worsens and it becomes unsuitable.

Although there is especially no limit about film thickness, 15mmicro-50mmicro is desirable practically. Although especially film construction material is not specified, either, films made of polyolefine system resin, such as polyethylene and polypropylene, are usually used suitably.

[0011] This film can be manufactured by the approach of degree account. Polyolefin resin (A) is consistency (ρ) 0.930 g/cm³ which consists of a copolymer of the homopolymer of ethylene or a propylene, ethylene or a propylene, and other comonomers (compound which has one or more with a carbon numbers of four or more double bonds in intramolecular). Following, Melt index (MI) 2g / polyolefine system thermoplastics for 10 or less minutes, for example, low density polyethylene and a line -- low density polyethylene and an ethylene-vinylacetate copolymer --

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With a consistency of 0.910 or less super-low density polyethylene, polypropylene, ethylene propylene rubber, Although any are sufficient as ethylene-propylene-diene copolymer and ethylene-methacrylic acid ester or such mixture desirable -- consistency 0.91-0.95 g/cm³ a line -- the low-density-polyethylene 50-100 weight section and consistency 0.91 g/cm³ rho which consists of the ethylene-alpha olefin copolymer 50-0 weight section of the following -- 0.930 g/cm³ Hereafter MI is 2g / polyolefine system thermoplastics for 10 or less minutes.

[0012] a line -- low density polyethylene is the copolymer of ethylene and other alpha olefins, for example, is manufactured by copolymerizing ethylene, and the about 4 - 17 % of the weight and other desirable alpha olefins, such as about 5 - 15% of the weight of 1-butene, 1-hexene, 1-octene, 1-decene, and 4-methyl-1-pentene, using the Ziegler type catalyst or the Philips mold catalyst used for inside low voltage method high-density-polyethylene manufacture.

[0013] As the above-mentioned ethylene-alpha olefin copolymer, it is the copolymer of ethylene and a with a carbon numbers of three or more alpha olefin, and the consistency is usually 3 0.91g/cm. The thing of the following is desirable and it is 0.85 - 0.90 g/cm³ more preferably. It is a thing. As a with a carbon numbers of three or more which carry out copolymerization to ethylene alpha olefin, a propylene, 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, etc. are mentioned, and nonconjugated diene, such as 1, 4-hexadiene, a dicyclopentadiene, and ethylidene norbornene, can also be used with these.

[0014] As for the above-mentioned ethylene-alpha olefin copolymer, it is desirable to be able to manufacture by carrying out copolymerization of ethylene and the alpha olefin using a Ziegler type catalyst and the catalyst which consists of a vanadium compound and organoaluminium compounds, such as vanadium trichloride oxide and a vanadium tetrachloride, especially, for the ethylene content in a copolymer to be 40-90-mol the range in which it is %, and for the content of an alpha olefin to be 10-60-mol the range in which it is %. As a commercial item of the above-mentioned ethylene-alpha olefin copolymer, for example CdF Chimie E. NORFLEX of P. company FREX resin of; Nippon Unicar (DFDA1137, DFDA1138, DEFD1210, DEFD9042); TAFUMA of a Mitsui petrochemical company (FW1600, FW1900, MW1920, SMW2440, LW2220, LW2500, LW2550) JSR-EP (EP02P, EP07P, EP57P) of (A4085, A4090, P0180, P0480), and Japan Synthetic Rubber Co., Ltd. etc. is mentioned.

[0015] Independent or the consistency (rho) of polyolefin resin (A) which is mixture is 0.930 g/cm³. If large, the synergistic effect of a plasticizer and a radical generating agent will be small, and tearing strength will not improve. Moreover, if MI is larger than 2g / 10 minutes, the tearing strength of a film will fall and shaping stability will fall.

[0016] In this invention approach, a melt index (MI) is the value measured based on the conditions 4 of the table 1 of JIS-K -7210 which is the reference standard of JIS-K -6760. In addition, according to a conventional method, even if it adds a thermostabilizer, UV stabilizer, a pigment, an antistatic agent, a fluorescence agent, etc., it does not interfere with polyolefin resin.

[0017] Next, an inorganic and organic bulking agent is used as a bulking agent of a component (B). As an inorganic bulking agent, a calcium carbonate, talc, clay, a kaolin, a silica, diatomaceous earth, a magnesium carbonate, a barium carbonate, magnesium sulfate, a barium sulfate, a calcium sulfate, an aluminum hydroxide, a zinc oxide, a magnesium hydroxide, a calcium oxide, magnesium oxide, titanium oxide, an alumina, a mica, asbestos powder, glass powder, milt balun, a zeolite, a clay silicate, etc. are used, and a calcium carbonate, talc, clay, a silica, diatomaceous earth, a barium sulfate, etc. are especially suitable.

[0018] As an organic bulking agent, cellulose type powder, such as wood flour and pulp powder, etc. is used. These are independent, or are mixed and used. As mean particle diameter of a

bulking agent, a thing 30 micrometers or less is desirable, a thing 10 micrometers or less is still more desirable, and what is 0.8-5 micrometers is the most desirable. When the compactness of the pore of a drawing object will worsen if particle size is too large, and particle size is too small, the dispersibility to resin is bad and a moldability is also inferior in it.

[0019] The surface treatment of a bulking agent is the dispersibility to resin, and a further ductile point, it is desirable to carry out, and a result with desirable processing with a fatty acid or its metal salt is given. The boiling point in 100 or more molecular weight to which the plasticizer of a component (C) has an ester bond or amide association in intramolecular, and ordinary pressure is [200 degrees C or more and the melting point] compounds 100 degrees C or less. For example, oleic amide, octadecanamide, dioctyl phthalate, trioctyl trimellitate, etc. are mentioned.

[0020] Preferably, they are the ester compound with which the boiling point in 350 or more molecular weight and ordinary pressure consists above 250 degrees C, and the melting point consists of a with a carbon numbers of six or more carboxylic acid and with a carbon numbers of five or more alcohol below 50 degrees C and the ester compound which the boiling point in 350 or more molecular weight and ordinary pressure is 250 degrees C or more, and the melting point is 30 degrees C or less, and consists of aromatic carboxylic acid and with a carbon numbers of six or more alcohol still more preferably, for example, DOP, trioctyl trimellitate, DIDP, etc.

[0021] If the melting point is higher than 100 degrees C, there will be little effectiveness of the improvement in tearing strength by denaturation by the radical generating agent, and shaping and ductility will fall [the boiling point] by the fume at the time of a fabricating operation, and foaming at less than 200 degrees C. Moreover, if molecular weight is small, the bleeding of a film to a plasticizer is not early desirable.

[0022] next, as a radical generating agent of the component (D) used for this invention The thing of the range whose decomposition temperature used as half-life 1 minute is 130-300 degrees C is desirable. For example, dicumyl peroxide, 2, the 5-dimethyl -2, 5-JI (t-butylperoxy) hexane, Peroxides, such as 2, 5-dimethyl -2, 5-screw (t-butylperoxy)-3-hexyne, alpha, and alpha'-screw (t-butylperoxy isopropyl) benzene, dibenzoyl peroxide, and G t-butyl peroxide, are mentioned.

[0023] this invention -- setting -- polyolefin resin -- (-- A --) -- 100 -- weight -- the section -- receiving -- a bulking agent -- (-- B --) -- 100 - 400 -- weight -- the section -- a plasticizer -- (-- C --) -- one - 100 -- weight -- the section -- and -- a radical -- generating -- an agent -- (-- D --) -- 0.0001 - 0.1 -- weight -- the section -- the range -- using -- a thing -- being desirable . If the rate of a bulking agent (B) does not fulfill the 100 weight sections, pore will not be enough formed in the extended film, but a porosity-sized degree will become low. Moreover, if the rate of a bulking agent exceeds the 400 weight sections, kneading nature, dispersibility, a film, or a sheet moldability will be inferior, and the surface reinforcement of a drawing object will fall further.

[0024] In this invention, especially the desirable blending ratio of coal is a bulking agent (B) 120 - the 300 weight sections to the polyolefin resin (A) 100 weight section. When there is less plasticizer (C) than 1 weight section, it does not have the effectiveness of the improvement in tearing strength, and if [than the 100 weight sections] more, kneading nature and dispersibility get worse and it cannot secure lowering of a film moldability, and ductility. They are below 50 weight sections more than 5 weight sections preferably.

[0025] Since are chosen out of the range of the 0.0001 - 0.1 weight section, the improvement in the tearing strength by the synergistic effect with a plasticizer is not obtained when fewer than this range, and a melt index becomes low too much when [than this range] more, a film piece tends to happen at the time of film shaping and surface deterioration occurs on a film front face, a radical generating agent (D) is not desirable.

[0026] In this invention, it mixes by the aforementioned quantitative ratio by the approach of the following I or II, and carry out inflation molding of them and usually let them be an unstretched film, after kneading polyolefin resin (A), a bulking agent (B), a plasticizer (C), and a radical generating agent (D) subsequently and pelletizing them.

Approach I: Pelletize and carry out inflation molding using this pellet, after mixing polyolefin resin, a bulking agent, a plasticizer, and a radical generating agent and kneading using kneading machines, such as an extruder and a Banbury mixer.

approach II: -- a lot of radical generating agents to polyolefin resin -- 0.5 - 1% (about 5000-10000 ppm) is blended, and this masterbatch is mixed with polyolefin resin, a bulking agent, and a plasticizer by preparing beforehand the masterbatch which moreover carried out melting kneading in the temperature more than the melting point of polyolefine and which radical generating agents were polyolefine and the temperature to which it hardly reacts, and was made into the pellet type, after kneading, it pelletizes, and inflation molding is carried out using this pellet.

[0027] If kneading-under heating (at temperature beyond temperature from which half-life of radical generating agent becomes 10 minutes preferably) processing of the polyolefin resin is carried out with a radical generating agent according to the approach shown in Above I or II, the denaturation polymer to which the crosslinking reaction by the radical generating agent occurred, polyolefine carried out intermolecular coupling, and the amount component of giant molecules increased, and the melt index fell will be obtained. This denaturation polymer tends to require lateral orientation compared with the polymer before denaturation at the time of inflation molding, and when drawing processing of this is carried out, tensile strength and collision reinforcement of the film obtained by doing in this way improve remarkably.

[0028] Although a drum, a tumbler mold mixer, a ribbon blender, a Henschel mixer, a super mixer, etc. are used in order to mix polyolefin resin, a plasticizer, a radical generating agent, and a bulking agent, the mixer of a high-speed churning mold like a Henschel mixer is desirable, and, as for especially polyethylene, it is usually desirable to supply with the gestalt of the powder of 20-60 meshes 10-150 meshes. Kneading of the obtained mixture is carried out using well-known kneading equipments, such as a screw extruder, a twin screw extruder, a roll mill, a Banbury mixer, and a 2 shaft type kneading machine.

[0029] In this invention, an unstretched film is fabricated by the tubular film process from the compound obtained above, and, subsequently drawing processing of this unstretched film is carried out. Inflation molding fabricates a blow up ratio (BUR) by 2-8. Preferably, the height of blows up ratio 3-6 and a frost line is increased 2 to 50 times of the diameter of the annular slit of a die. The height of a frost line is performed still more preferably under the conditions of the range of being 5 to 20 times many as the diameter of the annular slit of a die. Since the tensile strength and impact strength of a film will fall if a blow up ratio is lower than the above-mentioned range, and the shaping stability of a bubble will fall if higher than the above-mentioned range, it is not desirable. Moreover, since the tensile strength of a film will fall if the height of a frost line is lower than the above-mentioned range, and the shaping stability of a bubble will fall if higher than the above-mentioned range, it is not desirable.

[0030] Subsequently to a lengthwise direction (the direction of taking over of a film), uniaxial stretching of the unstretched film fabricated by the tubular film process is carried out. Although the roll extending method is usually adopted as uniaxial stretching, you may be the form where 1 shaft orientations (the direction of taking over) were made to emphasize by the tubular extending method. Moreover, as for drawing processing, multistage [one step or two steps or more of]

does not interfere. As for drawing processing, it is desirable to carry out in the range of temperature lower 50 degrees C than the melting point from temperature lower 90 degrees C than the range of temperature lower 20 degrees C than temperature lower 100 degrees C than the melting point of a resin constituent to the melting point, especially the melting point of a resin constituent, and it has the inclination for drawing spots to occur on a film and for the porosity of a film to fall at temperature higher than this range, at temperature lower than this range.

[0031] Draw magnification needs to be 1.2 to 8 times, and under this range is [porosity-izing and tensile strength of an oriented film] insufficient. Moreover, if draw magnification exceeds 8 times, a film becomes what has too much molecular orientation to a lengthwise direction, and the field reinforcement of a film falls and is not desirable [a film]. In addition, if it heat-treats after uniaxial stretching, the dimensional accuracy of a film can be stabilized and surface treatment, such as well-known corona treatment and frame processing, can also be performed.

[0032] Thus, by forming the obtained micropore, air permeability may join together, after 200 - 5000 seconds / 100ml, and water pressure-proof have put side by side the porosity film made of synthetic resin or sheet with which moisture vapor transmission was made into 1000 - 10,000gH₂O/m² and 24hr. more than 500mmH(s)²O to the film made of synthetic resin or sheet, and longitudinal direction of non-permeability.

[0033] The film made of synthetic resin, a sheet and the porosity film made of synthetic resin, or sheet of non-permeability may be combined with means, such as heat joining, ultrasonic welding, sewing, and adhesion. Such a film for fruits vegetable vegetation or a sheet is covered from three - four months before harvest at the time of harvest, covers a part for the ridges face of the fundamental circumference of arbor nature or herbaceous fruits vegetation, and a trough, and is used. a porous film or a sheet -- a ridge -- a part for the trough of comrades -- a bonnet, a non-breathable film, or a sheet -- a part for the ridge of the origin of fruits vegetation -- a wrap -- it is used like. Thus, adjustment of moisture and respiration rate is performed and fruits with high sugar content and acidity are obtained.

[0034] A nonwoven fabric may be stuck on a porosity film. For a nonwoven fabric, it consists of nylon, polyester (for example, polyethylene terephthalate, polybutylene terephthalate, etc.), or polyethylene (for example, nylon 6, Nylon 66, Nylon 12, etc.), and eyes are 15-30g/m². A thing is used. moreover, the embossing point consistency of the immobilization between fiber of a nonwoven fabric -- 60 piece/cm² -150 piece/cm² -- desirable -- 80 piece/cm²-120 piece/cm² The thing of extent is good. It is also possible to use the nonwoven fabric which vapor-deposited aluminum etc. to the nonwoven fabric and gave light reflex ability to it.

[0035] The thing using the fiber of the structure covered with polyethylene as a polyethylene system nonwoven fabric, using polyester resin as a core material is good. Moreover, as **** also with sufficient *****, eyes 10 - 80 g/cm², and a fiber size have a 70-700-denier thing preferably good by the heat welding method in **** using the rate fiber of a polyethylene system etc. ten to 2000 deal.

[0036] Such a porous film, and a nonwoven fabric and **** are stuck by the following bonded structures. That is, for example, the approach of applying urethane system 2 liquid type adhesives to punctiform at 10% - 30% (adhesion area) of spreading area, and pasting up is mentioned. The point part of adhesives is 3,180,000 pieces [2-10 million]/m². It is good for the path of the point to set to about 0.1-0.5mm with extent. What is necessary is just to perform punctiform spreading of such adhesives with the replica method which used for example, the gravure roll.

[0037] In a polyethylene system nonwoven fabric and ****, it is good to carry out heat adhesion

with a porosity film. Even if supposing that it is comparable as the above welds adhesion area all over a nonwoven fabric using a nonwoven fabric with many good openings, the rate for jointing of a porosity film should just be in the above-mentioned range. Since puncturing of a porosity film will be crushed if heat adhesion area is too large, caution is required. The three-layer laminate of a porosity film, ****, and a polyethylene system nonwoven fabric is sufficient.

[0038] according to the layered product of a configuration of having mentioned above, jointing which sticks a porosity film and a nonwoven fabric is very detailed -- moreover, the front face of a porosity film becomes very smooth by making thickness of a porosity film etc. into a factor, as a result, printing to the front face concerned can also be made very clear, and, moreover, a hand improves remarkably as a whole, and permeability is not spoiled

[0039] The nonwoven fabric of a layered product mentioned above is good at nonwoven fabrics by various processes, such as a span bond nonwoven fabric and a needle punch nonwoven fabric. Moreover, an atomizing process etc. can be used although the replica method with a gravure roll was illustrated as a method of applying adhesives about both adhesion. However, as for the adhesives used in this case, it is desirable to use for example, EVA system adhesives, elastomeric adhesive, or acrylic adhesives.

[0040] Upgrading of the garden stuff which is the object of this invention is reached by covering to a part for a part for the ridge of the fundamental circumference of fruits vegetation, and a trough, covering such a film for fruits vegetable vegetation or a sheet over harvest from one - two months before harvest. Although the upgrading effectiveness changes also with classes of garden stuff, it is specifically sugar content lifting, fruit cracking prevention, improvement in color luster, etc. The approach of covering is used so that a part for the trough to which the bonnet, the porous film, or the sheet separated the ridges face of the fundamental circumference of fruits vegetation from the origin of fruits vegetation with the film or sheet of non-permeability may be covered. Although especially a limit does not have the class of garden stuff to which the film for fruits vegetable vegetation or sheet of this invention is applied, citrus, such as a mandarin orange and Citrus hassaku, an apple, a pear, a peach, a grape, a melon, a watermelon, etc. are mentioned, for example.

[0041]

[Example] Hereafter, although an example explains this invention concretely, this invention is not restrained by the following examples unless the summary is exceeded.

an example 1 -- a line -- low-density-polyethylene {(melt index MI):1.0g/-- for 10 minutes Rate of flow : 19, consistency:0.921 g/cm³, a copolymerization component:1-butene, amount of copolymerization: -- what ground melting point:120-degree-C} to the powder of 40 meshes 10% of the weight -- 80 weight sections and ethylene propylene rubber (EPR --) Churning mixing of the 20 weight sections is carried out for what similarly ground EP07P to the powder of 40 meshes in a Henschel mixer. the Japan Synthetic Rubber Co., Ltd. make -- subsequently -- while carrying out 0.03 weight section churning of the dioctyl phthalate 4 weight section, the radical generating agent 2, the 5-dimethyl -2, and the 5-screw (t-butylperoxy)-3-hexyne as a plasticizer at this Addition mixing is carried out.

[0042] Furthermore, 200 weight sections addition of the calcium carbonate (mean particle diameter of 1.2 micrometers, fatty-acid processing) was carried out, and churning mixing was carried out. the mixture obtained in this way -- 2 -- it kneaded and corned using axial kneading-machine DSM-65 (Double Screw Mixer, Japan Steel Works, Ltd. make). Inflation molding of this was carried out with 40mmphi extruder, and the film was produced on the film with a thickness of 70 micrometers. Extrusion conditions are as follows.

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[0043]

[A table 1]

Cylinder temperature : A 170-190-210-230 degree-C head, dice temperature : 200-degree-C dice diameter : 100mm taking over rate : 8 m/min blow up ratio : 3 frost-line height : 700mm lay flat width : 471mm [0044] The roll drawing machine performed uniaxial stretching for what carried out the slit of the film obtained in this way in the direction of taking over. Drawing conditions were carried out as follows.

[0045]

[A table 2]

Drawing temperature : 60-degree-C drawing rate : Film thickness after a 11.0 m/min drawing: Physical-properties assessment of the porous film obtained 30 micrometers is as follows.

[0046]

[A table 3]

Air permeability 1800 second / 100ml moisture vapor transmission 3800 g/m² / water pressure-proof [24Hr] > 2000mm H₂O tearing strength 60 g/1-sheet moldability O flexibility O ductility O [0047] The following performed physical-properties assessment.

1) Moisture vapor transmission : ASTM It applies to E26-66(E).

2) Tearing strength : according to JIS-P -8116, measure the direction of taking over of a film and ask for the reinforcement per sheet by g.

3) Moldability : It judged by the following criteria by viewing.

O : Bubble stability, die-line-less O : ** with a ** die line: Film width fluctuation x : Shaping is impossible. [0048] 4) Flexibility : At the feel of a hand, it judged by the following criteria.

O cutting nothing and drawing nonuniformity -- almost -- nothing ** : cutting nothing and

drawing nonuniformity -- a little -- it is -- x : cutting or drawing nonuniformity size: Very soft O

: Soft ** : Somewhat hard x : Hard 5 ductility O : Cutting nothing, a homogeneity drawing, and

drawing-nonuniformity-less O : [0049] on the other hand -- a line -- low-density-polyethylene

(grade name Mitsubishi polyethylene LL and UA420) MI:0.8 g/l and consistency 0.925 g/cm³

using -- a briquetting machine -- a Placo air-cooling inflation-molding machine {diameter of

extruder SUIRYU 50mmphi, screw L/D ratio =28, and diameter of die 350mmphi (die slit gap

2.2mm)} -- using -- as a process condition It fabricated by the resin temperature of 200 degrees

C, extrusion outlet 130 kg/hr, taking over rate 35.5 m/min, and the blow ratio 3.0, and the film of the non-permeability of 1650mm width of 20micro thickness was created.

[0050] high -- a ridge -- the porous film and the non-breathable film which were obtained above

in the field of the satsuma orange made into the type were constructed. the height of the ridge of

a field -- about 50cm and pitch about 100cm -- it is -- a ridge -- the satsuma orange is mostly

planted in the center by the longitudinal direction every about 100cm. While forming puncturing

in the part which is equivalent to the tree of a mandarin orange about the above-mentioned non-

breathable film, from the flank of a film, the slit which reaches this puncturing was formed in the part of a ridge, and it constructed into it.

[0051] Moreover, to a part for the trough between ridges, the above-mentioned porous film was

constructed by width of face of 150cm. Construction was performed three months before [of

harvest] the satsuma orange (Chingtao Wenzhou) (August 15). Fruits were harvested three

months after (November 15), and quality was investigated. It was a Brix saccharimeter about the

sugar content, and as a result of measuring moisture by weight percentage reduction, it was 0.7

whenever [13 sugar content and citric-acid]. Moreover, fruits did not call at the location which

has become fruitful, but coloring nature was uniform.

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[0052] It laid to all for ridges faces and a trough by using as the film for fruits vegetable vegetation the non-porosity film used in the example of comparison 1 example 1. It laid three months before [of harvest] the satsuma orange (Chingtao Wenzhou) (August 15), fruits were harvested three months after (November 15), and quality was investigated. It was a Brix saccharimeter about the sugar content, and as a result of measuring moisture by weight percentage reduction, it was 1.2 whenever [11 sugar content and citric-acid]. Moreover, although coloring of the fruits of a location which the coloring nature of fruits changes with fruition locations of fruits, and a positive hits was good, what became fruitful in **** or a tree had bad coloring nature.

[0053]

[Effect of the Invention] Adjusting storm sewage by the approach of this invention, on the other hand, gas and the steam in soil carry out the through omission of the porous film plane laid by the amount of trough. In this way, a sugar content is high and the yield of an anti-hit [the good garden stuff of quality with whenever / low / citric-acid] is also obtained highly.

TECHNICAL FIELD

[Industrial Application] this invention establishes a ridge in a ground surface, and plants and grows fruits vegetable to this ridge -- high -- a ridge -- it is related with amelioration of the type fruits vegetable vegetation approach.

PRIOR ART

[Description of the Prior Art] as the vegetation approach of arbor nature, such as a mandarin orange, an apple, a grape, and a watermelon, or herbaceous fruits vegetation -- high -- a ridge -- there is the vegetation approach of a type. this -- high -- a ridge -- the vegetation approach of a type establishes a ridge in a ground surface by hilling, plants and grows vegetation to this ridge, and by giving fertilizer and water to a ridge, the centralized control of it becomes possible and it is used for caespitose vegetation of fruits etc.

[0003] On the other hand, if garden stuff is applied from three - four months before harvest at the time of harvest and water is originally supplied by the rainfall etc., it is known that will cause the increment in moisture and the increment in respiration rate in fruits, a sugar content and acidity will decrease, and quality will deteriorate. For this reason, it is possible to intercept the moisture to a bonnet and soil for a part for a part for a ridge, or trough Mabe in the meantime by litter before harvest generally for the purpose of upgrading. However, since waterproofness of litter is low, big effectiveness is not acquired.

[0004] Moreover, it is although how to cover earth surface, such as a ridge, with the plastic sheeting of non-permeability etc. is also considered, Although the activity by which it denudes except for a sheet and earth surface is covered with a sheet only in case of rainy weather is required at the time of fine weather therefore the root is filled with the carbon dioxide gas which occurs by breathing, a root will be in an asphyxiation condition and there is **** which causes the opposite effect since permeability is bad if it sets covered with the sheet of non-aeration and non-moisture permeability, this has a complicated activity.

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EFFECT OF THE INVENTION

[Effect of the Invention] Adjusting storm sewage by the approach of this invention, on the other hand, gas and the steam in soil carry out the through omission of the porous film plane laid by the amount of trough. In this way, a sugar content is high and the yield of an anti-hit [the good garden stuff of quality with whenever / low / citric-acid] is also obtained highly.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] this invention -- high -- a ridge -- it aims at offering the approach that the garden stuff whose quality improved can be obtained in type vegetation.

MEANS

[Means for Solving the Problem] the summary of this invention -- a ground surface -- hilling -- a ridge -- forming -- this -- fruits vegetation is grown to a ridge -- high -- a ridge -- the type fruits vegetable vegetation approach -- setting -- the ridges face of the fundamental circumference of fruits vegetation -- the synthetic-resin film or sheet of non-permeability -- covering -- a ridge -- it is characterized by covering a part for the trough between comrades with the porosity film made of synthetic resin or sheet which has permeability -- high -- a ridge -- it consists in the type fruits vegetable vegetation approach.

[0007] With the synthetic-resin film of non-permeability or sheet used by this invention, the film which is not colored [the monolayer of the thermoplastic synthetic resin usually used for agriculture etc. generally, such as polyethylene, polypropylene, and a polyvinyl chloride, a multilayer, coloring, and] is used. By covering a ridges face with the synthetic-resin film of such non-permeability, supply of the water for [before harvest] several months of fruits vegetation is lessened, and the role which raises a sugar content is made.

[0008] on the other hand -- the synthetic-resin film of non-permeability -- a ridges face and a ridge -- if it covers to a part for the trough between comrades, asphyxiation of a root which was mentioned above will be caused. for this reason, a ridge -- by covering with the porosity film made of synthetic resin or sheet which has permeability, the amount of [between comrades] trough emits a subterranean steam, and it helps breathing of a root.

[0009] Although the breathable film (the porosity film made of synthetic resin or sheet) used by this invention is a film which has permeability to gases, such as air and a steam, and has nontransparent nature to waterdrop (liquid), and it will be chosen out of the large range if it has the above-mentioned engine performance, the film of the engine performance more than air permeability 200 - 5000 seconds /, 100ml, or water pressure-proof 500mmH₂O is good.

[0010] Here, the approach of specifying air permeability to JIS-P -8117, the method of specifying moisture vapor transmission to JIS-Z-0208, and water pressure-proof are values measured by JIS-L-1092A law. If air permeability is too small, gas permeability will become the

cause which causes gas injury bad and hurts its root. Moreover, since it rises while soil cannot maintain at moderate dryness by permeating and crowding waterdrop if water pressure-proof is small but the upgrading effectiveness becomes indefinite, it is necessary to thicken a film, and a film is heavy, and since it becomes thick, handling nature worsens and it becomes unsuitable.

Although there is especially no limit about film thickness, 15mmicro-50mmicro is desirable practically. Although especially film construction material is not specified, either, films made of polyolefine system resin, such as polyethylene and polypropylene, are usually used suitably.

[0011] This film can be manufactured by the approach of degree account. Polyolefin resin (A) is consistency (ρ) 0.930 g/cm³ which consists of a copolymer of the homopolymer of ethylene or a propylene, ethylene or a propylene, and other comonomers (compound which has one or more with a carbon numbers of four or more double bonds in intramolecular). Following, Melt index (MI) 2g / polyolefine system thermoplastics for 10 or less minutes, for example, low density polyethylene and a line -- low density polyethylene and an ethylene-vinylacetate copolymer -- With a consistency of 0.910 or less super-low density polyethylene, polypropylene, ethylene propylene rubber, Although any are sufficient as ethylene-propylene-diene copolymer and ethylene-methacrylic acid ester or such mixture desirable -- consistency 0.91-0.95 g/cm³ a line -- the low-density-polyethylene 50-100 weight section and consistency 0.91 g/cm³ ρ which consists of the ethylene-alpha olefin copolymer 50-0 weight section of the following -- 0.930 g/cm³ Hereafter MI is 2g / polyolefine system thermoplastics for 10 or less minutes.

[0012] a line -- low density polyethylene is the copolymer of ethylene and other alpha olefins, for example, is manufactured by copolymerizing ethylene, and the about 4 - 17 % of the weight and other desirable alpha olefins, such as about 5 - 15% of the weight of 1-butene, 1-hexene, 1-octene, 1-decene, and 4-methyl-1-pentene, using the Ziegler type catalyst or the Philips mold catalyst used for inside low voltage method high-density-polyethylene manufacture.

[0013] As the above-mentioned ethylene-alpha olefin copolymer, it is the copolymer of ethylene and a with a carbon numbers of three or more alpha olefin, and the consistency is usually 3 0.91g/cm. The thing of the following is desirable and it is 0.85 - 0.90 g/cm³ more preferably. It is a thing. As a with a carbon numbers of three or more which carry out copolymerization to ethylene alpha olefin, a propylene, 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, etc. are mentioned, and nonconjugated diene, such as 1, 4-hexadiene, a dicyclopentadiene, and ethylidene norbornene, can also be used with these.

[0014] As for the above-mentioned ethylene-alpha olefin copolymer, it is desirable to be able to manufacture by carrying out copolymerization of ethylene and the alpha olefin using a Ziegler type catalyst and the catalyst which consists of a vanadium compound and organoaluminium compounds, such as vanadium trichloride oxide and a vanadium tetrachloride, especially, for the ethylene content in a copolymer to be 40-90-mol the range in which it is %, and for the content of an alpha olefin to be 10-60-mol the range in which it is %. As a commercial item of the above-mentioned ethylene-alpha olefin copolymer, for example CdF Chimie E. NORFLEX of P. company FREX resin of; Nippon Unicar (DFDA1137, DFDA1138, DEFD1210, DEFD9042); TAFUMA of a Mitsui petrochemical company (FW1600, FW1900, MW1920, SMW2440, LW2220, LW2500.LW2550) JSR-EP (EP02P, EP07P, EP57P) of (A4085, A4090, P0180, P0480), and Japan Synthetic Rubber Co., Ltd. etc. is mentioned.

[0015] Independent or the consistency (ρ) of polyolefin resin (A) which is mixture is 0.930 g/cm³. If large, the synergistic effect of a plasticizer and a radical generating agent will be small, and tearing strength will not improve. Moreover, if MI is larger than 2g / 10 minutes, the tearing strength of a film will fall and shaping stability will fall.

[0016] In this invention approach, a melt index (MI) is the value measured based on the conditions 4 of the table 1 of JIS-K -7210 which is the reference standard of JIS-K -6760. In addition, according to a conventional method, even if it adds a thermostabilizer, UV stabilizer, a pigment, an antistatic agent, a fluorescence agent, etc., it does not interfere with polyolefin resin.

[0017] Next, an inorganic and organic bulking agent is used as a bulking agent of a component (B). As an inorganic bulking agent, a calcium carbonate, talc, clay, a kaolin, a silica, diatomaceous earth, a magnesium carbonate, a barium carbonate, magnesium sulfate, a barium sulfate, a calcium sulfate, an aluminum hydroxide, a zinc oxide, a magnesium hydroxide, a calcium oxide, magnesium oxide, titanium oxide, an alumina, a mica, asbestos powder, glass powder, milt balun, a zeolite, a clay silicate, etc. are used, and a calcium carbonate, talc, clay, a silica, diatomaceous earth, a barium sulfate, etc. are especially suitable.

[0018] As an organic bulking agent, cellulose type powder, such as wood flour and pulp powder, etc. is used. These are independent, or are mixed and used. As mean particle diameter of a bulking agent, a thing 30 micrometers or less is desirable, a thing 10 micrometers or less is still more desirable, and what is 0.8-5 micrometers is the most desirable. When the compactness of the pore of a drawing object will worsen if particle size is too large, and particle size is too small, the dispersibility to resin is bad and a moldability is also inferior in it.

[0019] The surface treatment of a bulking agent is the dispersibility to resin, and a further ductile point, it is desirable to carry out, and a result with desirable processing with a fatty acid or its metal salt is given. The boiling point in 100 or more molecular weight to which the plasticizer of a component (C) has an ester bond or amide association in intramolecular, and ordinary pressure is [200 degrees C or more and the melting point] compounds 100 degrees C or less. For example, oleic amide, octadecanamide, dioctyl phthalate, trioctyl trimellitate, etc. are mentioned.

[0020] Preferably, they are the ester compound with which the boiling point in 350 or more molecular weight and ordinary pressure consists above 250 degrees C, and the melting point consists of a with a carbon numbers of six or more carboxylic acid and with a carbon numbers of five or more alcohol below 50 degrees C and the ester compound which the boiling point in 350 or more molecular weight and ordinary pressure is 250 degrees C or more, and the melting point is 30 degrees C or less, and consists of aromatic carboxylic acid and with a carbon numbers of six or more alcohol still more preferably, for example, DOP, trioctyl trimellitate, DIDP, etc.

[0021] If the melting point is higher than 100 degrees C, there will be little effectiveness of the improvement in tearing strength by denaturation by the radical generating agent, and shaping and ductility will fall [the boiling point] by the fume at the time of a fabricating operation, and foaming at less than 200 degrees C. Moreover, if molecular weight is small, the bleeding of a film to a plasticizer is not early desirable.

[0022] next, as a radical generating agent of the component (D) used for this invention The thing of the range whose decomposition temperature used as half-life 1 minute is 130-300 degrees C is desirable. For example, dicumyl peroxide, 2, the 5-dimethyl -2, 5-JI (t-butylperoxy) hexane, Peroxides, such as 2, 5-dimethyl -2, 5-screw (t-butylperoxy)-3-hexyne, alpha, and alpha'-screw (t-butylperoxy isopropyl) benzene, dibenzoyl peroxide, and G t-butyl peroxide, are mentioned.

[0023] this invention -- setting -- polyolefin resin -- (-- A --) -- 100 -- weight -- the section -- receiving -- a bulking agent -- (-- B --) -- 100 - 400 -- weight -- the section -- a plasticizer -- (-- C --) -- one - 100 -- weight -- the section -- and -- a radical -- generating -- an agent -- (-- D --) -- 0.0001 - 0.1 -- weight -- the section -- the range -- using -- a thing -- being desirable . If the rate of a bulking agent (B) does not fulfill the 100 weight sections, pore will not be enough formed in the extended film, but a porosity-ized degree will become low. Moreover, if the rate of a bulking

agent exceeds the 400 weight sections, kneading nature, dispersibility, a film, or a sheet moldability will be inferior, and the surface reinforcement of a drawing object will fall further. [0024] In this invention, especially the desirable blending ratio of coal is a bulking agent (B) 120 - the 300 weight sections to the polyolefin resin (A) 100 weight section. When there is less plasticizer (C) than 1 weight section, it does not have the effectiveness of the improvement in tearing strength, and if [than the 100 weight sections] more, kneading nature and dispersibility get worse and it cannot secure lowering of a film moldability, and ductility. They are below 50 weight sections more than 5 weight sections preferably.

[0025] Since are chosen out of the range of the 0.0001 - 0.1 weight section, the improvement in the tearing strength by the synergistic effect with a plasticizer is not obtained when fewer than this range, and a melt index becomes low too much when [than this range] more, a film piece tends to happen at the time of film shaping and surface deterioration occurs on a film front face, a radical generating agent (D) is not desirable.

[0026] In this invention, it mixes by the aforementioned quantitative ratio by the approach of the following I or II, and carry out inflation molding of them and usually let them be an unstretched film, after kneading polyolefin resin (A), a bulking agent (B), a plasticizer (C), and a radical generating agent (D) subsequently and pelletizing them.

Approach I: Pelletize and carry out inflation molding using this pellet, after mixing polyolefin resin, a bulking agent, a plasticizer, and a radical generating agent and kneading using kneading machines, such as an extruder and a Banbury mixer.

approach II: -- a lot of radical generating agents to polyolefin resin -- 0.5 - 1% (about 5000-10000 ppm) is blended, and this masterbatch is mixed with polyolefin resin, a bulking agent, and a plasticizer by preparing beforehand the masterbatch which moreover carried out melting kneading in the temperature more than the melting point of polyolefine and which radical generating agents were polyolefine and the temperature to which it hardly reacts, and was made into the pellet type, after kneading, it pelletizes, and inflation molding is carried out using this pellet.

[0027] If kneading-under heating (at temperature beyond temperature from which half-life of radical generating agent becomes 10 minutes preferably) processing of the polyolefin resin is carried out with a radical generating agent according to the approach shown in Above I or II, the denaturation polymer to which the crosslinking reaction by the radical generating agent occurred, polyolefine carried out intermolecular coupling, and the amount component of giant molecules increased, and the melt index fell will be obtained. This denaturation polymer tends to require lateral orientation compared with the polymer before denaturation at the time of inflation molding, and when drawing processing of this is carried out, tensile strength and collision reinforcement of the film obtained by doing in this way improve remarkably.

[0028] Although a drum, a tumbler mold mixer, a ribbon blender, a Henschel mixer, a super mixer, etc. are used in order to mix polyolefin resin, a plasticizer, a radical generating agent, and a bulking agent, the mixer of a high-speed churning mold like a Henschel mixer is desirable, and, as for especially polyethylene, it is usually desirable to supply with the gestalt of the powder of 20-60 meshes 10-150 meshes. Kneading of the obtained mixture is carried out using well-known kneading equipments, such as a screw extruder, a twin screw extruder, a roll mill, a Banbury mixer, and a 2 shaft type kneading machine.

[0029] In this invention, an unstretched film is fabricated by the tubular film process from the compound obtained above, and, subsequently drawing processing of this unstretched film is carried out. Inflation molding fabricates a blow up ratio (BUR) by 2-8. Preferably, the height of

blows up ratio 3-6 and a frost line is increased 2 to 50 times of the diameter of the annular slit of a die. The height of a frost line is performed still more preferably under the conditions of the range of being 5 to 20 times many as the diameter of the annular slit of a die. Since the tensile strength and impact strength of a film will fall if a blow up ratio is lower than the above-mentioned range, and the shaping stability of a bubble will fall if higher than the above-mentioned range, it is not desirable. Moreover, since the tensile strength of a film will fall if the height of a frost line is lower than the above-mentioned range, and the shaping stability of a bubble will fall if higher than the above-mentioned range, it is not desirable.

[0030] Subsequently to a lengthwise direction (the direction of taking over of a film), uniaxial stretching of the unstretched film fabricated by the tubular film process is carried out. Although the roll extending method is usually adopted as uniaxial stretching, you may be the form where 1 shaft orientations (the direction of taking over) were made to emphasize by the tubular extending method. Moreover, as for drawing processing, multistage [one step or two steps or more of] does not interfere. As for drawing processing, it is desirable to carry out in the range of temperature lower 50 degrees C than the melting point from temperature lower 90 degrees C than the range of temperature lower 20 degrees C than temperature lower 100 degrees C than the melting point of a resin constituent to the melting point, especially the melting point of a resin constituent, and it has the inclination for drawing spots to occur on a film and for the porosity of a film to fall at temperature higher than this range, at temperature lower than this range.

[0031] Draw magnification needs to be 1.2 to 8 times, and under this range is [porosity-izing and tensile strength of an oriented film] insufficient. Moreover, if draw magnification exceeds 8 times, a film becomes what has too much molecular orientation to a lengthwise direction, and the field reinforcement of a film falls and is not desirable [a film]. In addition, if it heat-treats after uniaxial stretching, the dimensional accuracy of a film can be stabilized and surface treatment, such as well-known corona treatment and frame processing, can also be performed.

[0032] Thus, by forming the obtained micropore, air permeability may join together, after 200 - 5000 seconds / 100ml, and water pressure-proof have put side by side the porosity film made of synthetic resin or sheet with which moisture vapor transmission was made into 1000 - 10,000gH₂O/m² and 24hr. more than 500mmH(s)² O to the film made of synthetic resin or sheet, and longitudinal direction of non-permeability.

[0033] The film made of synthetic resin, a sheet and the porosity film made of synthetic resin, or sheet of non-permeability may be combined with means, such as heat joining, ultrasonic welding, sewing, and adhesion. Such a film for fruits vegetable vegetation or a sheet is covered from three - four months before harvest at the time of harvest, covers a part for the ridges face of the fundamental circumference of arbor nature or herbaceous fruits vegetation, and a trough, and is used. a porous film or a sheet -- a ridge -- a part for the trough of comrades -- a bonnet, a non-breathable film, or a sheet -- a part for the ridge of the origin of fruits vegetation -- a wrap -- it is used like. Thus, adjustment of moisture and respiration rate is performed and fruits with high sugar content and acidity are obtained.

[0034] A nonwoven fabric may be stuck on a porosity film. For a nonwoven fabric, it consists of nylon, polyester (for example, polyethylene terephthalate, polybutylene terephthalate, etc.), or polyethylene (for example, nylon 6, Nylon 66, Nylon 12, etc.), and eyes are 15-30g/m². A thing is used. moreover, the embossing point consistency of the immobilization between fiber of a nonwoven fabric -- 60 piece/cm² -150 piece/cm² -- desirable -- 80 piece/cm²-120 piece/cm² The thing of extent is good. It is also possible to use the nonwoven fabric which vapor-deposited aluminum etc. to the nonwoven fabric and gave light reflex ability to it.

[0035] The thing using the fiber of the structure covered with polyethylene as a polyethylene system nonwoven fabric, using polyester resin as a core material is good. As **** also with sufficient *****, 2 and a fiber size have a 70-700-denier thing preferably good [moreover,] by the heat welding method in **** using the rate fiber of a polyethylene system etc. ten to 2000 deal 10-80g [/cm] eyes.

[0036] Such a porous film, and a nonwoven fabric and **** are stuck by the following bonded structures. That is, for example, the approach of applying urethane system 2 liquid type adhesives to punctiform at 10% - 30% (adhesion area) of spreading area, and pasting up is mentioned. The point part of adhesives is 3,180,000 pieces [2-10 million]/m/m2. It is good for the path of the point to set to about 0.1-0.5mm with extent. What is necessary is just to perform punctiform spreading of such adhesives with the replica method which used for example, the gravure roll.

[0037] In a polyethylene system nonwoven fabric and ****, it is good to carry out heat adhesion with a porosity film. Even if supposing that it is comparable as the above welds adhesion area all over a nonwoven fabric using a nonwoven fabric with many good openings, the rate for jointing of a porosity film should just be in the above-mentioned range. Since puncturing of a porosity film will be crushed if heat adhesion area is too large, caution is required. The three-layer laminate of a porosity film, ****, and a polyethylene system nonwoven fabric is sufficient.

[0038] according to the layered product of a configuration of having mentioned above, jointing which sticks a porosity film and a nonwoven fabric is very detailed -- moreover, the front face of a porosity film becomes very smooth by making thickness of a porosity film etc. into a factor, as a result, printing to the front face concerned can also be made very clear, and, moreover, a hand improves remarkably as a whole, and permeability is not spoiled

[0039] The nonwoven fabric of a layered product mentioned above is good at nonwoven fabrics by various processes, such as a span bond nonwoven fabric and a needle punch nonwoven fabric. Moreover, an atomizing process etc. can be used although the replica method with a gravure roll was illustrated as a method of applying adhesives about both adhesion. However, as for the adhesives used in this case, it is desirable to use for example, EVA system adhesives, elastomeric adhesive, or acrylic adhesives.

[0040] Upgrading of the garden stuff which is the object of this invention is reached by covering to a part for a part for the ridge of the fundamental circumference of fruits vegetation, and a trough, covering such a film for fruits vegetable vegetation or a sheet over harvest from one - two months before harvest. Although the upgrading effectiveness changes also with classes of garden stuff, it is specifically sugar content lifting, fruit cracking prevention, improvement in color luster, etc. The approach of covering is used so that a part for the trough to which the bonnet, the porous film, or the sheet separated the ridges face of the fundamental circumference of fruits vegetation from the origin of fruits vegetation with the film or sheet of non-permeability may be covered. Although especially a limit does not have the class of garden stuff to which the film for fruits vegetable vegetation or sheet of this invention is applied, citrus, such as a mandarin orange and Citrus hassaku, an apple, a pear, a peach, a grape, a melon, a watermelon, etc. are mentioned, for example.

EXAMPLE

[Example] Hereafter, although an example explains this invention concretely, this invention is not restrained by the following examples unless the summary is exceeded.

an example 1 -- a line -- low-density-polyethylene {(melt index MI):1.0g/-- for 10 minutes Rate of flow : 19, consistency:0.921 g/cm³, a copolymerization component:1-butene, amount of copolymerization: -- what ground melting point:120-degree-C} to the powder of 40 meshes 10% of the weight -- 80 weight sections and ethylene propylene rubber (EPR --) Churning mixing of the 20 weight sections is carried out for what similarly ground EP07P to the powder of 40 meshes in a Henschel mixer. the Japan Synthetic Rubber Co., Ltd. make -- subsequently -- while carrying out 0.03 weight section churning of the dioctyl phthalate 4 weight section, the radical generating agent 2, the 5-dimethyl -2, and the 5-screw (t-butylperoxy)-3-hexyne as a plasticizer at this Addition mixing is carried out.

[0042] Furthermore, 200 weight sections addition of the calcium carbonate (mean particle diameter of 1.2 micrometers, fatty-acid processing) was carried out, and churning mixing was carried out. the mixture obtained in this way -- 2 -- it kneaded and corned using axial kneading-machine DSM-65 (Double Screw Mixer, Japan Steel Works, Ltd. make). Inflation molding of this was carried out with 40mmphi extruder, and the film was produced on the film with a thickness of 70 micrometers. Extrusion conditions are as follows.

[0043]

[A table 1]

Cylinder temperature : A 170-190-210-230 degree-C head, dice temperature : 200-degree-C dice diameter : 100mm taking over rate : 8 m/min blow up ratio : 3 frost-line height : 700mm lay flat width : 471mm [0044] The roll drawing machine performed uniaxial stretching for what carried out the slit of the film obtained in this way in the direction of taking over. Drawing conditions were carried out as follows.

[0045]

[A table 2]

Drawing temperature : 60-degree-C drawing rate : Film thickness after a 11.0 m/min drawing: Physical-properties assessment of the porous film obtained 30 micrometers is as follows.

[0046]

[A table 3]

Air permeability 1800 second / 100ml moisture vapor transmission 3800 g/m² / water pressure-proof [24Hr] > 2000mm H₂ O tearing strength 60 g/l-sheet moldability O flexibility O ductility O [0047] The following performed physical-properties assessment.

- 1) Moisture vapor transmission : ASTM It applies to E26-66(E).
- 2) Tearing strength : according to JIS-P -8116, measure the direction of taking over of a film and ask for the reinforcement per sheet by g.
- 3) Moldability : It judged by the following criteria by viewing.

O : Bubble stability, die-line-less O : ** with a ** die line: Film width fluctuation x : Shaping is impossible. [0048] 4) Flexibility : At the feel of a hand, it judged by the following criteria.

O cutting nothing and drawing nonuniformity -- almost -- nothing ** : cutting nothing and drawing nonuniformity -- a little -- it is -- x : cutting or drawing nonuniformity size: Very soft O : Soft ** : Somewhat hard x : Hard 5 ductility O : Cutting nothing, a homogeneity drawing, and drawing-nonuniformity-less O : [0049] on the other hand -- a line -- low-density-polyethylene (grade name Mitsubishi polyethylene LL and UA420) MI:0.8g/l. and consistency 0.925 g/cm³ using -- a briquetting machine -- a Placo air-cooling inflation-molding machine {diameter of extruder SUIRYU 50mmphi, screw L/D ratio =28, and diameter of die 350mmphi (die slit gap

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2.2mm)) -- using -- as a process condition It fabricated by the resin temperature of 200 degrees C, extrusion outlet 130 kg/hr, taking over rate 35.5 m/min, and the blow ratio 3.0, and the film of the non-permeability of 1650mm width of 20micro thickness was created.

[0050] high -- a ridge -- the porous film and the non-breathable film which were obtained above in the field of the satsuma orange made into the type were constructed. the height of the ridge of a field -- about 50cm and pitch about 100cm -- it is -- a ridge -- the satsuma orange is mostly planted in the center by the longitudinal direction every about 100cm. While forming puncturing in the part which is equivalent to the tree of a mandarin orange about the above-mentioned non-breathable film, from the flank of a film, the slit which reaches this puncturing was formed in the part of a ridge, and it constructed into it.

[0051] Moreover, to a part for the trough between ridges, the above-mentioned porous film was constructed by width of face of 150cm. Construction was performed three months before [of harvest] the satsuma orange (Chingtao Wenzhou) (August 15). Fruits were harvested three months after (November 15), and quality was investigated. It was a Brix saccharimeter about the sugar content, and as a result of measuring moisture by weight percentage reduction, it was 0.7 whenever [13 sugar content and citric-acid]. Moreover, fruits did not call at the location which has become fruitful, but coloring nature was uniform.

[0052] It laid to all for ridges faces and a trough by using as the film for fruits vegetable vegetation the non-porosity film used in the example of comparison 1 example 1. It laid three months before [of harvest] the satsuma orange (Chingtao Wenzhou) (August 15), fruits were harvested three months after (November 15), and quality was investigated. It was a Brix saccharimeter about the sugar content, and as a result of measuring moisture by weight percentage reduction, it was 1.2 whenever [11 sugar content and citric-acid]. Moreover, although coloring of the fruits of a location which the coloring nature of fruits changes with fruition locations of fruits, and a positive hits was good, what became fruitful in **** or a tree had bad coloring nature.